3.6 ENERGY CONSUMPTION

3.6.1 Introduction

This section focuses on the demand for electrical power that would be generated by operation of the Species Conservation Habitat (SCH) Project. Diesel fuel, gasoline, and power used during construction and maintenance activities would be the only other source of substantive energy consumption; the permanent employees would use minor amounts of fuel. The equipment and vehicles used during construction and maintenance would be the minimum needed to perform the required work, and fuel would not be used in a wasteful manner. Therefore, fuel consumption and electrical demand during construction is not addressed in this section. The study area comprises the service area of the Imperial Irrigation District (IID), which would provide electrical power to the SCH Project. Issues associated with Project compatibility with geothermal development are addressed in Section 3.13, Land Use.

Table 3.6-1 summarizes the impacts of the six Project alternatives on energy consumption, compared to both the existing conditions and the No Action Alternative.

Table 3.6-1 Summary of Impacts on Energy Consumption

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact EN-1: Pumping would require power for the duration of the Project.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.6.2 Regulatory Requirements

3.6.2.1 State Regulations

A number of state laws dealing with renewable energy and greenhouse gas (GHG) emissions have affected the way IID chooses to acquire its energy resources, including Senate Bill (SB) 1368, SB 2120, SB 1078, Assembly Bill (AB) 32, and Executive Orders S-14-08 and S-21-09 (IID 2010a).

SB 1368 prohibits any retail seller of electricity in California from entering into a long-term (greater-than-5-year) financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out of state as well as in state, and to publicly owned as well as investor-owned electric utilities.

SB 2120 first established a standard to provide 20 percent of energy from renewable sources by 2010. This target does not directly bind IID, although IID voluntarily agreed to meet this goal in 2007 as a result of rate impact considerations (IID 2010a).

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard requires retail suppliers of electric services to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010. IID is required to register all renewable resources that it owns or constructs, track the net output from each of the certified resources, and report it to the Western Region Renewable Electricity Information System established by the California Energy Commission (IID 2010a). For purchase power agreements, the generator owner is required to provide the necessary data to this information system to verify that sales to the IID are certified as renewable resources (IID 2010a).

The California Global Warming Solutions Act of 2006, widely known as AB 32, and Governor Schwarzenegger's Executive Order S-14-08 direct all state entities, including irrigation districts, to achieve at least 33 percent renewable energy by 2020. AB 32 requires the California Air Resources Board to develop and enforce regulations for the reporting and verification of statewide GHG emissions, including establishing a cap and trade emissions control mechanism by 2012.

Since 2006, California has had a mandate to increase the use of renewable generation to 20 percent of retail electricity sales by 2010 (refer to description of SB 1078 and SB 107 above). In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which raises California's renewable energy goals to 33 percent by 2020. This enhanced target is intended to help California meet statewide GHG emission reduction targets, and has been reiterated by California Executive Order S-21-09, which requires California Air Resources Board, by July 31, 2010, to establish a regulation consistent with this 33 percent target by 2020; however, no new renewable energy standard pursuant to S-21-09 has been set to date.

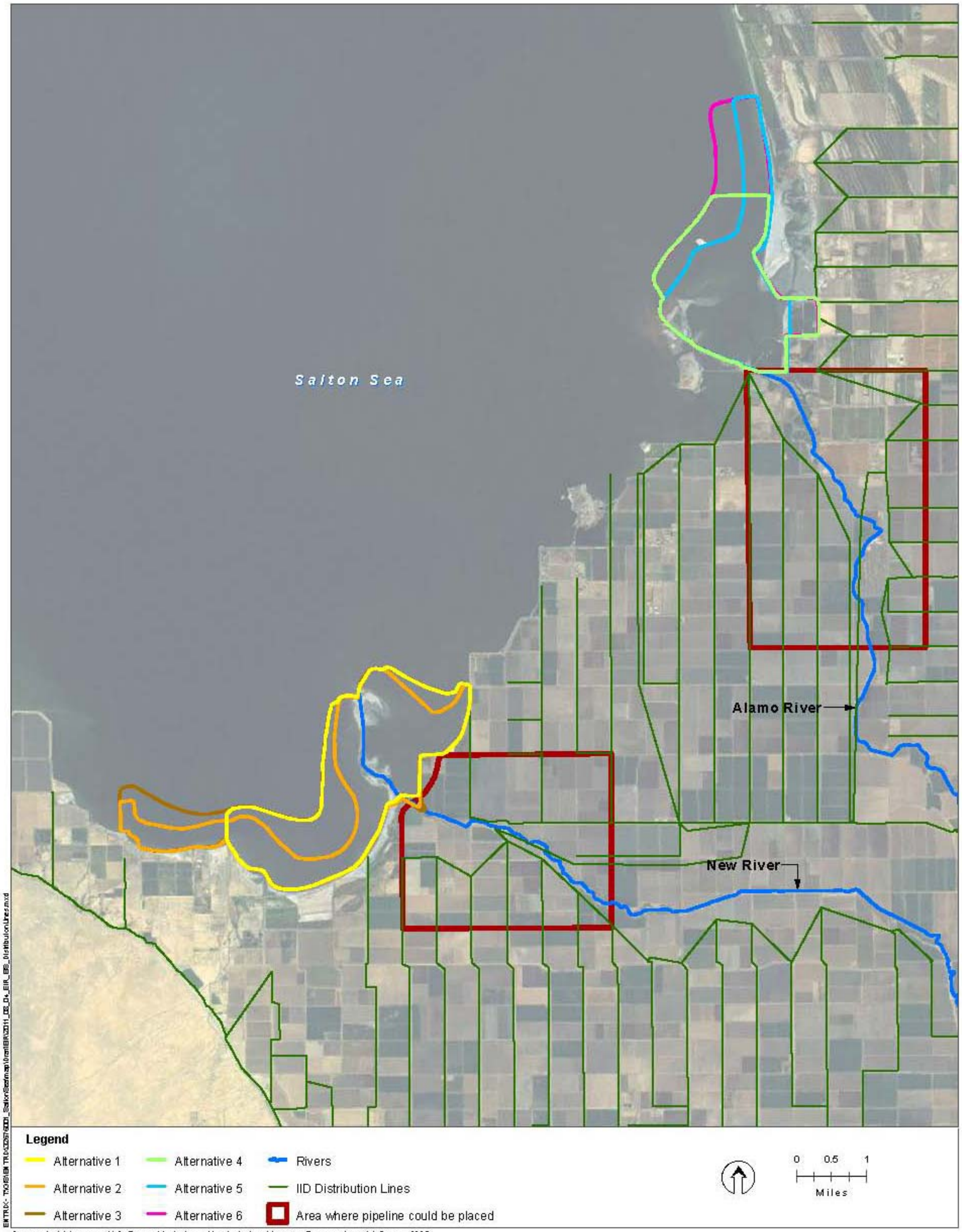
3.6.2.2 Imperial Irrigation District, 2010 Integrated Resources Plan

IID's *2010 Integrated Resources Plan* (IID 2010a) attempts to merge IID's goals and objectives with regulatory requirements that mandate the adoption of new renewable energy portfolio standards, reducing GHG emission, and acquiring cost-effective resources. The plan includes a number of goals, including the following:

- Implement energy efficiency programs necessary to reduce load by at least 5 percent by 2015, with a 10 percent load reduction goal by 2020;
- Meet or exceed all state and Federal planning criteria for renewable resources with a goal of generating 20 percent of energy requirements from renewable sources by 2012, 23 percent by 2014, 26 percent by 2017, and at least 33 percent by 2020; and
- Reduce GHG emissions by at least 35 percent by 2020 in comparison to 2009 levels to minimize the cost of purchasing emission allowance credits in the marketplace.

3.6.3 Affected Environment

IID provides energy on a wholesale and retail basis to more than 145,000 customers in Imperial, Riverside, and San Diego counties (IID 2010b). IID's distribution system in the vicinity of the SCH Project is shown on Figure 3.6-1. IID obtains power from a variety of sources, including hydroelectric plants located on the All American Canal System; the San Juan Unit 3, a coal plant in New Mexico; the Palo Verde Nuclear Generation Station in Arizona; and natural gas and diesel generation within or near the service area boundary. In 2009, the peak demand in the service area was slightly under 1,000 megawatts (MW).



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.6-1 IID's Power Distribution System near the SCH Project

IID is required to have generation resources providing reserves totaling approximately 15 percent of load. Thus, IID is required to be able to deliver nearly 1,150 MW (for the peak summer months). IID expects to see significant load growth as the California economy begins to recover, and retail energy use is expected to increase as a result. However, IID's energy forecasts still show a small energy increase of around 0.7 percent from 2008 through 2012 (IID 2010a).

IID is proposing a new generation plan, the Base Case Power Supply Plan, to meet renewable portfolio standards and GHG emission reduction requirements for the period 2010 through 2012. The proposed resource plan includes a new 145 MW combined cycle generation facility at the existing El Centro Steam Plant Unit 3 by 2012; entering into a power purchase agreement for 50 MW of geothermal generation for delivery by 2013; entering into a power purchase agreement for 20 MW of solar thermal generation by 2012; and entering into a power purchase agreement for 17 MW of geothermal generation by 2014 with other Southern California Public Power Authority members (IID 2010a).

IID is implementing energy efficiency programs with the goal of reducing peak demand by up to 50 MW within 5 years, including conservation and demand-side management programs. These programs target air conditioning, lighting, and equipment efficiency. Some new programs implemented by IID in 2010 include the Ice Bear Thermal Energy Storage Program, which could reduce peak demand by almost 10 MW, and the Key Customer Demand Response Program, which pays major industrial and commercial customers to curtail their load or operate on-site generators during periods of high demand. IID hopes to acquire 30-40 MW from the Key Customer Demand Response Program in 2010 (IID 2010a).

3.6.4 Impacts and Mitigation Measures

3.6.4.1 Impact Analysis Methodology

Project impacts were assessed by considering whether the energy consumption resulting from the operation of Project alternatives would be wasteful or whether opportunities exist to minimize power demand.

3.6.4.2 Thresholds of Significance

Significance Criteria

Impacts on energy consumption would be significant if the Project alternatives would result in the inefficient, wasteful, or unnecessary consumption of energy.

Application of Significance Criteria

Incidental energy use would be associated with the trailer used by the permanent employees as office space (e.g., for lighting). This minimal electrical demand would not be wasteful and is not considered further. Power demand would result primarily from the operation of electric pumps to deliver water to the Project from the New or Alamo rivers (under Alternatives 2, 3, 5, and 6) and the Salton Sea (all Project alternatives). The river diversion would be located within 100 yards of the SCH delivery point and would be a low-head lift (about 10 feet). The Sea diversion, however, could be up to 2 miles away from the SCH ponds. The lift would initially be low head (10 to 15 feet) but would increase as the Sea recedes. Three-phase power would be extended to the pump locations.

The amount of water supply pumped from each source would vary depending on the desired salinity of the ponds and the length of time the water would remain in the pond (residence time). The energy required to pump from a river would be less than the energy required to pump a similar amount from the Salton Sea because the required head (lift and length of pipeline) would be greater and because the density of saline water would be greater than the water diverted from the rivers. In addition, the seawater pumps may be subject to fouling from salt that would reduce the pump efficiency over time. The residence time and salinity of the pond water also would change the power requirements. Higher salinity levels and shorter residence would require more power consumption than a longer residence time with lower salinity water.

The total power requirements for the Project alternatives, assuming 4-week and 16-week residence times for different concentrations of salinity are shown in Table 3.6-2.

Table 3.6-2 Power Requirements (in Kilowatt Hours) for Different Residence Times and Salinity Concentrations

4-week Residence Time						
	20 ppt			40 ppt		
Alternative	Seawater	River Water	Total	Seawater	River Water	Total
1	16,517		16,517	60,935		60,935
2	18,067	2,663	20,730	41,971	743	42,714
3	26,142	5,566	31,708	61,733	2,129	63,861
4	14,616		14,616	33,430		33,430
5	8,534	1,636	10,169	20,010	488	20,498
6	32,958	4,103	37,061	39,213	1,076	40,289
16-week Residence Time						
	20 ppt			40 ppt		
Alternative	Seawater	River Water	Total	Seawater	River Water	Total
1	3,185		3,185	22,025		22,025
2	1,608	780	2,388	9,103	210	9,314
3	5,211	1,976	7,187	11,660	360	12,020
4	1,287		1,287	6,972		6,972
5	1,014	516	1,530	4,824	154	4,978
6	2,416	1,076	3,491	15,433	250	15,683
Note: ppt = parts per thousand						

Because the SCH is a proof-of-concept project, the testing of different salinity and residence times is an integral part of the Project, and the SCH operation would result in different pumping rates and energy consumption as identified in Table 3.6-2. This use of energy is not considered inherently unnecessary or wasteful.

3.6.4.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007), the No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, IID, as mitigation for the IID Water Conservation and Transfer

Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at Salton Sea State Recreation Area, as well as boat launches along the shoreline. Under the No Action Alternative, it is assumed that IID would provide electrical services to facility and construction sites around the shoreline and on the seabed. Overall, electrical consumption is projected to increase steadily in the future. It is anticipated that IID will continue to implement its *Integrated Resources Plan* and energy efficiency planning to meet future demands and requirements for incorporating alternative energy sources into its energy network.

3.6.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The New River diversion would be gravity fed under Alternative 1; thus, pumping from the Salton Sea would constitute the primary long-term energy demand. A seawater pump would be provided from 1 to 2 miles from the existing shore, and a recirculation pump would be located at the intermediate berm separating the independent pond from the cascading pond. The seawater pump would lose efficiency over time because of the hypersaline water being pumped, but would be maintained as appropriate to reduce fouling and would be replaced when needed. The recirculation pump would also recirculate saline water from the ponds to offset some of the Sea's pumping. The recirculation pump would collect water at the cascading pond and introduce it into the saline water line at the head of the system. Thus, the Project would not use energy in an inefficient or wasteful manner. This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.6.4.5 Alternative 2 – New River, Pumped Diversion

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). Alternative 2 differs from Alternative 1 in that water would be pumped from the New River as well as from the Salton Sea. The Sea's pumping station would be located 1 to 2 miles from the shore. As discussed above, the efficiency of the saline pump is of more concern than that of the river water pump, but the pump would be maintained appropriately and replaced when needed. Therefore, impacts would be less than significant.

3.6.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

3.6.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Alternative 4 differs from Alternative 1 in that no recirculation pump would be required, and a seawater pump would be provided at Red Hill with a pipeline projecting out into the Sea. This pump would be easier to maintain than one in the Sea because it would be land-based.

3.6.4.8 Alternative 5 –Alamo River, Pumped Diversion

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to Alternative 5.

3.6.4.9 Alternative 6 –Alamo River, Pumped Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 2 and 4 are applicable to Alternative 6.

3.6.5 References

California Department of Water Resources and California Department of Fish and Game. 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

Imperial Irrigation District (IID). 2010a. 2010 Integrated Resources Plan.

Imperial Irrigation District (IID). 2010b. Energy history. Website (http://www.iid.com/index.aspx?page=263) accessed November 1, 2010.

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